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RESEARCH PROCESS PIDHOTOVKYHRUNTU for sowing beets TSUKROVYHSUCHASNYMY units

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In the article results of comparative field study of modern experimental units for preplant tillage before sowing sugar beet by a combined indicator - field germination of seeds. Proposed a new geometric model of the working surface tillage implements that according to experiments prevailing working bodies cultivator USMK-5,4B.

Beet sugar, process, Pre-tillage, sowing, field germination of seeds.

Formulation of the problem. Pre-tillage (TDG) is designed to loosen the surface layer to fine-hrudochkuvatoho state at a depth of laying the seeds, creating aligned compacted seed bed and favorable conditions for germination, destruction of germs and weeds stairs. Meanwhile Pre-tillage is part of a single process - sowing of sugar beet (BC), so made no gap in time before the passage of the seed unit.

Analysis of recent research. Standards agronomic parameters and requirements of State Standard provides that the average depth should be at TDG 3-5 cm deviations from preset to ±1,0 cm when the number of lumps with a diameter of 25 mm at least 92% [1], because the seeds with high odnorostkovosti and laboratory germination is accommodated in a prepared soil specific structure, moisture and hardness at a given depth of drilling (Fig. 1) and with a uniform step along line. The above has a positive impact on seed germination and field simultaneity (friendliness) stairs, which generally increases starting development of plants and, consequently, productivity culture. According to research IBKiTsB (VS Glukhovskaya, 1982) and Ukr NDIPVT them. L. Pogorelogo (OA Makovetskiy, 1989) such as performance indicators TDG as specified depth and uniformity hrudochkuvatist loosened soil surface compared with the humidity and temperature of the soil is much more significant (11-14% vs. 7-10%) influence on the integral index - the field

seed germination (Fig. 2). At the same time, respect the uniformity of depth cultivation also contributes compaction seedbed, and through fines lumps treated surface layer chunks secured better enveloping seeds and improving access of light to the shoots, which also contributes to the field seed germination and simultaneity of germination (Fig. 1).

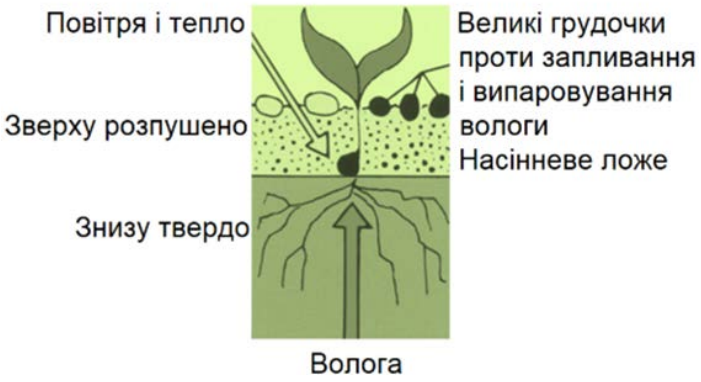

Fig. 1. Scheme wrapping seed into the soil at sowing and germination power.

Fig. 2. The degree of influence (%), basic technological factors on field germination of seeds (by prof. Glukhovskaya VS).

The purpose of researchis to study the influence of the main process parameters preplant tillage field on seed germination and development of models working surface tillage implements.

Results. The essence of the process of grinding (kryshinnya) ground is the destruction of relationships between its parts (units) as a result of the action of the working surfaces of (PO), followed by separation of soil particles apart (loosening), that kryshinnya soil - the process of converting chunks of soil some volume V = abv in clumps, similar in shape, such as a ball or cube [2].

The expression to determine the work that is spent on a given volume V kryshinnya ground (PA Rehbinder, 1968) after the relevant changes is as follows: $A = \frac{\pi d_{\text{гр}}^2}{4E}\sigma^2 \ln \xi$Where: ξ = dn / dhr - degree kryshinnya soil; dn - initial diameter lumps; dhr - average diameter after loosening lumps; σ - stress (tensile) soil compression, g / cm2; E - modulus, MPa. Consequently, work on the crushing soil increases with the degree of kryshinnya tensile strength and compression depends on

the shape and baking powder. Based on the analysis forms edge work surfaces baking powder ground as West European production (firms LEMKEN, ROPA - Germany; WADERSTAG - Switzerland etc.) And Ukrainian (USMK.- 5,4B, KOZR - 8.1, etc.) Made in form of pointed teeth needle or dolotopodibnoho types and their capabilities crumble the soil by means of cutting the perimeter formed by the movement in the space of elementary wedge (chisel) developed a geometric model of the disc surface tillage implements, characterized in that the cross-section of the teeth is designed as an equilateral trapezoid and quartered - a right triangle, long legs which is perpendicular to the axis of hub and intersects at a right angle trapezoid with a larger basis [3].

Working bodies have consistently set the unit trains, equalizers, dual-clutches razor teeth spring rods rotors (Fig. 4). Width 9.0 m, speed of 9-12 km / h.

For the preplant soil uses aggregate ARV 8,1-0,2, which is equipped with dual blades, razors, rods, rotors and drums loops (Fig. 5).

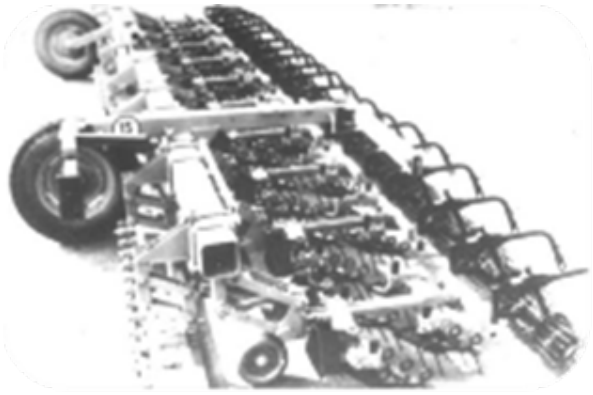

Fig. 4. The unit ARV 8,1-01. Fig. 5. The unit ARV 8,1-02

Tooth proposed design, perekochuyuchys in soil, stretches processed chunk in a longitudinal direction and simultaneously compresses cross, creating a stress-strain state of soil in which according to the theory of Coulomb-Mohr balance compressive and tensile strains provided increasing technical indicators kryshinnya soil monolith and reduce energy consumption, especially when working on hard soil. Comparative field studies of new experimental tool consisting of RO Parts boronchastoho and serial cultivator USMK-5,4B (control) conducted in DPDH "Shevchenko" IBKiTsB showed that the experimental PO do not yield a serial, and the density of the soil 1,2-1, 3 g / cm3 and low humidity (16-18.5%) significantly dominate them (on average 4-6% in the number of lumps in diameter and 25 mm in the loosened soil layer), which has

provided increasing field germination (Fig. 6). In the system of technological methods of modern domestic technology intensive early spring loosening and leveling the soil mostly combined in one operation. To perform these operations in a single pass unit used modern antiretroviral 8,1-01 designed and Ukr NDISHOM IBKiTsB that is aggregated with tractors of class 20-30 kN (T-150, DT-75M and new plowing HTZ-121 HTZ-16031).

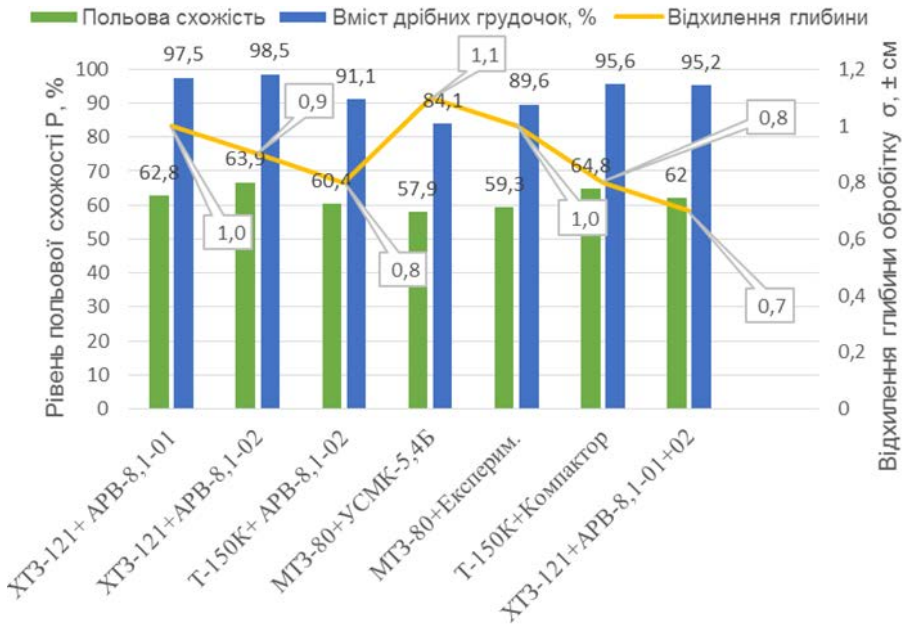

Fig. 6. Dependence field germination of seeds from soil depths (4,0 ± σ) cm and the contents of small lumps (Ø < 25 mm).

Research technologies in three variants to settled Lyulynetskyy-DSS IBKiTsB found that of soil preparation before planting new BTS units ARV 8,1-0,1 / 0,2 / cultivators using KOZR-5,4-01 / 02 / at care of crops provides a significant increase in yield 2,7-3,4 t / ha to control where used cultivators USMK serial-5,4B [4].

In Ukr NDIPVT them. L. Pogorelogo conducted comparative field research quality indicators TDG implementation process a number of means: modern combined units ARV ARV 8,1-01 and 8,1-02, compactors "K-600A" (Germany), Row 5 USMK , 4B (JSC "Umanfermmash") (control); thus defining the volume of energy [5, 6]. Ahrehatuvaly machines with tractors MTZ-80 and T-150K HTZ-121 and sowing drill conducted Multykorn (Germany) after each tillage units. The highest seed field germination (laboratory 80-85%) 64.8% (NIR05 = 0.8%) were in the case of preplant tillage compactor unit with a tractor T-150 by achieving the most uniform depth rozpushuvanoho surface layer of soil and its proper grinding (Fig. 6). However, the capacity of this unit was at MTZ-80 + USMK-5,4B and more than twice as inferior

odnooperatsiynym units, especially with the tractor HTZ-121, and fuel consumption while doubling (Fig. 6).

Domestic combined unit consisting of ARV ARV 8,1-01 and 8,1-02, is attached to the front and rear mounted system tractor HTZ-121, compared with Kompatorom (3720 kg) also materialoyemkyy (3750 kg) but in the case of the same operating speed (7.5 km / h) performance of its larger 2.2 ha / h (by increasing width), and lower fuel consumption at 1.7 kg / ha. However, due to worsening uniformity rozpushuvanoho layer depth and quality of the field loosening seed germination significantly decreased (62.0% vs 64.8%).

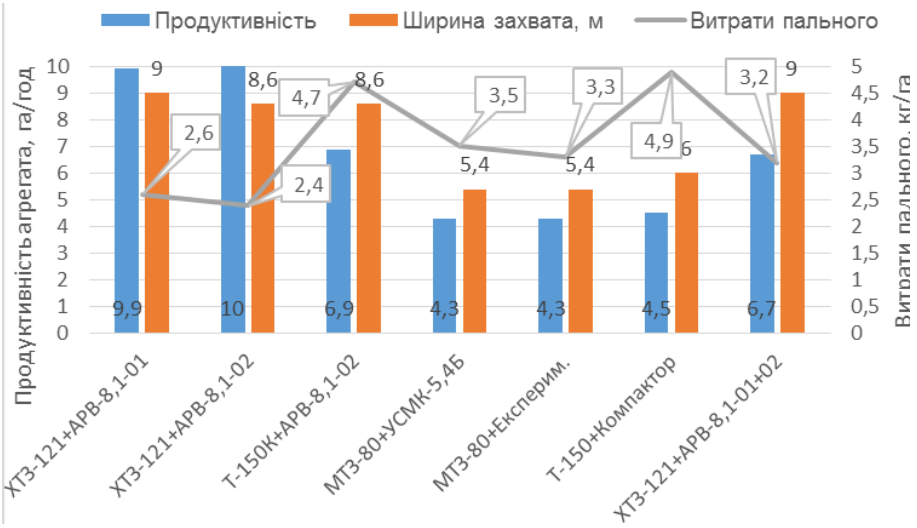

Fig. 7. Dependence of productivity of aggregates for preplant tillage of width and fuel consumption.

The most technical and economic indicators providing unit HTZ-121 + ART 8,1-02, although the field germination of seeds it slightly (0.9%) is second compactor. The cost of fuel is reduced by half, and the specific process enerhonasychenist - three times [5]. But the main advantage of this unit is increased productivity - 10 ha / year, which more than doubled compared to the compactor or cultivator USMK-5,4B, thus ensuring realization of planting in the shortest possible time. Thus, even referring to the price compactors that at times the price of domestic cultivators, and guided only by the results of agrotechnical and technical and economic evaluation, we can conclude the feasibility of using for preplant tillage unit consisting HTZ-121 + ARV 8, 1-02.

Conclusions

In the integral index twofold process of sowing of sugar beet (Pre-tillage and seeding) - field germination of seeds significantly affects the uniformity of its depth and shallowness laying lumps loosened surface layer of soil over it.

Among modern machines for preplant tillage highest field germination of seeds provides compactors (Germany) in the unit with tractors T-150K. However, the performance of this unit more than doubled inferior domestic odnooperatsiynym antiretroviral or ARV 8,1-01 8,1-02, paclaged of plowing tractors HTZ-121 at twice the cost of fuel.

The combined unit consisting of batches at the front and rear mounted system tractor HTZ-121 guns ARV ARV 8,1-01 and 8,1-02, compared with the same Kompatorom when working speed (7.5 km / h), shows greater productivity by 2.2 ha / h and fuel consumption less than 1.7 kg / ha.

The most technical and economic indicators providing unit HTZ-121 + ART 8,1-02 when consumption is reduced by half, and productivity increases of up to 10 ha / h, thus sowing works are carried out in a much styhlishi terms, increased levels of seed germination and field as a result, productivity culture.

Soil with a new tool working surface (patent №47743) not inferior mass-5,4B USMK cultivators in terms of agronomic requirements, and the soil density 1.2-1.3 g / cm3 and low humidity (16-18,5%) essentially it prevails (on average 4-6% in the number of lumps in diameter and 25 mm in the loosened soil layer), which has provided increasing field germination of seeds.

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In Article pryvedeny sravnytelnыh polevыh эksperymentalnыh results of research sovremennыh agregatov for conducting predposevnoy obrabotku soil before posevom saharnoy beet on

yntehralnomu indicators - polevoy vshozhesty semyan. Predlahaetsya Novaya heometrycheskaya model of a working surface pochvoobrabatыvayuscheho orudyya, kotoraja on dannыt эksperymentov preobladaet Rabochie orhanы cultivator USMK-5,4B.

***Saharan beet, tehnolohycheskyy process, predposevnaya obrabotku soil, posev, polevaya vshozhest semyan**.*

The paper presents experimental results of comparative testing ground before sowing of sugar beet by the integral indicator - seed germination. The proposed geometrical model of the working surface, which according to the experiments is dominated by the working bodies of the cultivator USMK-5,4B.

Sugar beet, technological process, preplant tillage, sowing, field germination of seeds.